

Claims:

1. A method of producing a carbon nanotube tip, comprising the steps of:
providing a tip assembly;
applying a metallic catalytic material to the tip assembly;
5 inserting said tip assembly bearing said metallic catalytic material into a CVD reactor; and
exposing said tip assembly bearing said metallic catalytic material to a gaseous atmosphere comprising a carbon containing gas, thereby producing a tip assembly bearing a carbon nanotube tip.
- 10 2. The method of claim 1, wherein the tip assembly comprises silicon.
3. The method of claim 1 wherein the tip assembly is a multifaced probe.
4. The method of claim 3 wherein one or more faces of the tip assembly comprises a mask.
5. The method of claim 4 wherein the mask is removable.
- 15 6. The method of claim 3 wherein the multifaced tip assembly comprises silicon.
7. The method of claim 1, wherein carbon nanotube tips are produced on an array of tip assemblies.
8. The method of claim 1, wherein the metallic catalytic material is selected
20 from the group consisting of metals, metal oxides, metallic salts, metallic particles and metallic colloids.
9. The method of claim 8, wherein the metallic catalytic material is selected from the group consisting of iron salts, nickel salts, cobalt salts, platinum salts, molybdenum salts, and ruthenium salts.

10. The method of claim 8 wherein the metallic catalytic material is selected from the group consisting of iron colloids, nickel colloids, cobalt colloids, platinum colloids, molybdenum colloids, and ruthenium colloids.
11. The method of claim 9 wherein the metallic catalytic material is a ferric salt.
- 5 12. The method of claim 11 wherein the metallic catalytic material is ferric nitrate.
13. The method of claim 10 wherein the metallic catalytic material is an iron colloid.
14. The method of claim 9 wherein the metallic catalytic material is in solution.
- 10 15. The method of claim 14 wherein the solution comprises an alcohol.
16. The method of claim 15 wherein the alcohol is selected from the group consisting of methanol, ethanol and isopropanol.
17. The method of claim 1, wherein the carbon containing gas is ethylene.
18. The method of claim 1, wherein the carbon nanotube tip is a SWNT.
- 15 19. The method of claim 1, wherein the carbon nanotube tip comprises a plurality of SWNTs.
20. The method of claim 1, wherein the carbon nanotube tip is a MWNT.
21. The method of claim 1, further comprising the step of shortening the carbon nanotube tip by electrical etching.
- 20 22. The method of claim 21, wherein electrical etching comprises applying voltage pulses of a predetermined voltage between the nanotube tip and a support surface.
23. A method of fabricating nanotube-based nanostructures by controlled deposition of nanotube segments comprising the steps of:

biasing a tip assembly bearing a carbon nanotube tip at a starting location on a substrate at a predetermined voltage;

scanning the tip assembly bearing a carbon nanotube tip along a predetermined path; and

applying a voltage pulse at a higher voltage than the predetermined voltage thereby disconnecting the nanotube tip from tip assembly and depositing a nanotube segment on the substrate.

24. The method of claim 23, wherein the nanotube tip is a single wall nanotube.

25. A method of producing nano-tweezers comprising at least two carbon nanotube tips, comprising the steps of:

providing a tip assembly;

applying at least two independent electrodes to the tip assembly; and

applying at least one carbon nanotube tip to each of the electrodes to produce a nanotweezer, wherein the spacing between respective end portions of the carbon nanotube tips changes in response to a voltage applied between the at least two electrodes.

26. The method of claim 25, wherein applying at least one carbon nanotube tip comprises the steps of :

applying metallic catalytic material to at least one electrode; and

inserting said at least one electrode into a CVD reactor; and

exposing said at least one electrode to a gaseous atmosphere comprising a carbon containing gas, thereby producing at least one electrode bearing a carbon nanotube tip.

27. The method of claim 25, wherein the carbon nanotube tip is a single SWNT.
28. The method of claim 25, wherein the carbon nanotube tip comprises a plurality of SWNTs.
29. The method of claim 25 wherein the carbon nanotube tip is a MWNT.